

Práctica Pedagógica y Concepciones de Profesores de Matemáticas.

Pedagogical Practice and Conceptions of Mathematics Teachers.

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Key-words

Learning And Teaching Of Mathematics, Conceptions, Teacher Training, Pedagogical Practice.

Abstract: This article presents results of a research that aimed to analyze the characteristics of the pedagogical practice of beginning teachers in basic secondary education. The research was carried out under a qualitative approach through case study. The data collection instruments were three questionnaires designed and applied to 5 graduated professors from the Bachelor of Mathematics program (LM, as the acronym in Spanish) of the Pedagogical and Technological University of Colombia (UPTC), with no more than 5 years of experience, graduated as of 2015, who have taught in public or private schools, in secondary and middle education. In addition, the class observation of each participant was carried out in order to describe the actions in the classroom, examining attitudes, resources, methodologies and relevant expressions. Also, a model of conceptions about mathematics was made based on the theories of Ponte (1992) and Godino (2004) considering idealism, instrumentalism, constructivism and dynamism. This research showed that according to the conception adopted by the teacher, her actions will be reflected in the classroom. Within idealism it is highlighted that, in pedagogical practices, mathematics is considered as the set of rules, facts and procedures; in instrumentalism the importance of acquiring some basic algorithms is reflected; in constructivism the applicability of mathematics and dynamism are highlighted; and the dynamism shows the contextualization of the of mathematical knowledge in culture and society. In conclusion, it is considered that the training of mathematics teachers has a certain impact on practices when teaching experience is minimal and they adopt some of the methodologies of their high school and middle school teachers as well as university teachers.

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Palabras clave

Aprendizaje Y Enseñanza De Las Matemáticas, Concepciones, Formación De Profesores, Práctica Pedagógica.

Resumen: Este artículo presenta resultados de una investigación que tuvo como objetivo analizar las características de la práctica pedagógica de los profesores iniciantes en educación básica secundaria. La investigación se desarrolló bajo un enfoque cualitativo con estudio de caso. Como instrumentos de recolección de información se diseñaron y aplicaron tres cuestionarios a 5 profesores graduados del programa Licenciatura en Matemáticas (LM) de la Universidad Pedagógica y Tecnológica de Colombia (UPTC), con experiencia no mayor a 5 años, graduados a partir del 2015, que han ejercido o ejercen la docencia en colegios públicos o privados, en educación secundaria y media; además se realizó la observación de clase de cada participante, con el fin describir las acciones en el aula, examinando actitudes, recursos, metodologías y expresiones relevantes. A la vez, se realizó un modelo de concepciones sobre la matemática basado en las teorías de Ponte (1992) y Godino (2004) considerando el idealismo, instrumentalismo, constructivismo y dinamismo. Esta investigación permitió evidenciar que de acuerdo con la concepción que adopte el profesor así se reflejan sus acciones en el aula de clase. Dentro del idealismo se resalta que en las prácticas pedagógicas la matemática se considera como el conjunto de reglas, hechos y procedimientos; en el instrumentalismo se refleja la importancia de adquirir algunos algoritmos básicos; en el constructivismo se destaca la aplicabilidad de las matemáticas; y el dinamismo muestra la contextualización del saber matemático en la cultura y la sociedad. Finalmente, se considera que la formación de los profesores de matemáticas incide notablemente en las prácticas cuando la experiencia en docencia es mínima y adoptan algunas metodologías de sus profesores tanto de secundaria y media como universitaria.

Introduction

The pedagogical practices of mathematics teachers involve various aspects, including academic training at the secondary and high school levels, university education, and professional development as a mathematics teacher, according to De la Torre (2006), the training of mathematics teachers has been considered controversial for several years, firstly because it is a subject with constant changes and secondly because there is no clarity regarding the institutions and persons in charge of teacher training.

On the other hand, we talk about the conceptions of mathematics, which according to Godino (2004) are related to the beliefs and opinions held regarding the teaching and learning process of the area, which generates different approaches and attitudes that implicitly affect the educational community; for example, conceiving mathematics as the memorization of algorithms promoting a mechanical process without the objective of meaningful learning

for the student, typical of a traditional education (Rico, 2000). For this reason, it is necessary for teachers to be immersed in contexts related to daily life, focusing on social activities and not only on the mastery of knowledge.

Therefore, it is necessary to question what are the real motivations that lead each person to study the program and verify who graduates being motivated by vocation and who by a different interest, and thus identify the conceptions that arise from the beginning of their studies until graduation, in order to establish the relationship in the process of training as a student of the LM program and their work experience; In addition, to identify those initial expectations generated by the academic program, taking into account that the perception of the mathematics teacher's work and what it really implies to be a teacher in this area of knowledge, which is not only based on mathematics as a science, but also on its pedagogy and didactics, is fundamental.

Theoretical Aspects

The research was supported by some theories on pedagogical practices, teacher training, conceptions about mathematics, among others.

Pedagogical practice

According to Zuluaga (1999), the main elements in the field of pedagogical practice are considered to be the teacher, student, knowledge and procedures, which allow exploring the connection of the practice taking into account the relationship of education from everyday life and the sociocultural contexts based on the knowledge taught and its didactics. On the other hand, Díaz (2006) mentions that the purpose of pedagogical practice is to train students in different disciplines based on the fulfillment of a curriculum and curricular guidelines. Similarly, for Rodríguez (2006), pedagogical practice is "a space for learning to teach" (p. 20). Therefore, the knowledge offered in the different scenarios is expected to be valid, useful and correct for performance in different everyday situations; thus, the training received by teachers in training must be sufficient to be able to perform efficiently in their working life at any educational level and in any area of knowledge.

On the other hand, the Ministry of National Education (2006) conceives pedagogical practice as:

A process of self-reflection, which becomes a space for conceptualization, research and didactic experimentation, where the undergraduate student approaches knowledge in an articulated manner, and from different disciplines that enrich the understanding of the educational process and the teaching function in it (p. 5).

For this reason, in the pedagogical practice the student confronts his training process with the reality in the classroom, where tools are necessary

to enable him to perform his work in an appropriate manner and meet the academic requirements.

Thus, with respect to pedagogical practices as a mathematics teacher, Serres (2007) points out that they are an accumulation of teaching strategies that seek to promote student learning; thus, it is necessary for the teacher to have mastery of the different thematic contents and also use the appropriate resources to avoid generating obstacles for the student; Taking into account that the teacher's resources are based on pedagogical models, which have great influence in the classroom, this leads to the development of assertive communication strategies without leaving aside the nature of the knowledge of the area taught, that is, that the practice is understood as a process that undergoes changes according to the nature of the student and the classroom context (Barrero and Mejía, 2005).

On the other hand, the pedagogical practices of teachers in the area of mathematics according to Gómez (1991) should be developed thinking about the student's educational process, from the motivation that occurs in the classroom, the active participation in the development of the different activities and the implementation of meaningful tasks through the feedback of the processes, he also points out that when in the development of a task the student discovers and applies what he has learned, it is more meaningful.

Another aspect to take into account, according to Fernández et al (2018), is the relationship of mathematics with the affective domain, highlighting the importance of generating, on the part of the teacher, a mathematical environment in the classroom that achieves in the student confidence, disposition and empathy, aimed at relating the cognitive part with empirical experiences, in order to generate different emotions and attitudes in the student to incorporate it into an objective, affective and assertive mathematical community for learning.

In agreement, Niño, Hernández and Bonilla (2018) state that pedagogical practices are derived from the practical knowledge and control of the teacher in his emotions and criteria at the moment of conceptualizing his mathematical knowledge in the classroom, giving security and confidence to his pedagogical skills as an educator directly involving the student's learning from his disposition towards the development and development in the area.

According to Hernández (2014), pedagogical practices in mathematics are successful when the following components converge: teacher training, experience, mathematical knowledge and the efficient and effective capacity to solve classroom situations. Thus, the practices of mathematics teachers are influenced by their professional training as mathematics graduates, their mastery of the mathematical objects to be taught, the way they develop in their teaching practice and the interaction among the members of the educational community: students, fellow teachers, managers, parents and administrators.

Teacher training in mathematics

When discussing pedagogical practices, it is important to inquire about the professional training process of the students of the LM of the UPTC, where its mission is to train integral professionals who are able to address the needs that society demands, as well as to contribute to the reflective and creative processes in the mathematical and social field, generating changes from the classroom, in order to promote educational quality.

In the same way, Maroto (2009) affirms that teacher training in many cases does not allow an approach to the educational reality that is lived in the classrooms of secondary education institutions; therefore, the LM program of the UPTC has general, interdisciplinary, disciplinary and deepening areas, which seek the integral formation of the student.

On the other hand, Shulman (2005) points out that "the key to distinguish the knowledge base for teaching lies at the intersection of subject matter and didactics" (p. 21), and that the teacher must have the ability to convert his knowledge into didactic and striking forms that adapt and impress students.

Teacher training in mathematics according to Ponte (1992) has a frame of reference, training proposals and group dynamics, which seek to lead the student in training to a process of self-reflection of his practice based on his conceptions in the field of teaching this area of knowledge. In addition, in their training, it is essential to investigate the teaching practice inside and outside the classroom in order to reach a social sense of knowledge and its disciplinary relationship (Rico and Sierra, 1991).

It should be emphasized that in the initial training of mathematics teachers it is essential to relate the theoretical part with practice from the beginning of their studies, since the teacher in training brings with the conceptions that are limited to the experiences in the primary and secondary school process (Fonseca and Castillo, 2013). Academic programs focused on the training of mathematics teachers should direct the student to generate an interactive pedagogy with positive communication, where the real context of the pedagogical practice to which the undergraduate student will be exposed as a future mathematics teacher is related, incorporating security and suitability to be able to develop his/her profession in the classroom and thus generate different expectations of the area.

In this sense, Flores et al (2014) state that the professional is formed fundamentally in the exercise of practice, thus pointing out that this process is gradual and systematic, for this reason it is essential that during the training process the student has contact with the classroom, and thus can identify weaknesses and strengths of their pedagogical practice in order to determine their inclination towards teaching. In this sense, the authors point out

that "it is about going back and forth from theory to practice and from practice to theory, with the purpose of achieving continuous improvement and improvement of teaching practice" (p. 24).

In the training of mathematics teachers, it is of vital importance to take into account that the teacher will not only perform in their specific area of knowledge in the classroom, but must also have human competencies, so that the teacher can develop in a socio-cultural context, for which continuous and innovative training is necessary to generate suitable competencies in the development of his or her pedagogical practice.

Conceptions

For Rodríguez and Marrero (1993, cited in Carmona 2015) conceptions are defined as "personal pedagogical theories, reconstructed on the basis of pedagogical knowledge historically elaborated and transmitted through training and pedagogical practice. It is therefore a synthesis of cultural knowledge and personal experiences" (p. 245). Accordingly, in the development of pedagogical practice, teachers adapt some of the experiences, methodologies and resources of their teachers that were part of their academic training, appropriating them as a model for classroom work.

For Godino, Font and Batanero (2004), conceptions of mathematics are derived from opinions and beliefs and from the role played by the teacher in this process and the cognitive activity, for which he proposes two types of conceptions: the idealist-platonist conception and a constructivist-social one. The first refers to the mathematical domain, in the pure aspect of mathematics, considering that the student must acquire the fundamental structures of mathematical axioms for its understanding. The applications of mathematics remain in the background without the need to be studied in other disciplines, only a study is made of inner problems of mathematics, and the second

refers to the close relationship that mathematics has with its applications, thus the vision of mathematics and its teaching arises from some situations of nature and society in order to build fundamental structures of mathematics.

In this way, the importance of distinguishing beliefs from conceptions in the teacher training process is highlighted, since beliefs are associated with processes and practical activities of the area, while conceptions identify ideas that are rooted through academic experience; in this regard Zapata and Blanco (2007) state that conceptions are framed in opinions based on the concepts that are acquired from the different subjects in the construction of their school life.

For their part, Ramos and Casas (2018) state that "there are differences in academic training regarding the conceptions about teaching and learning that teachers have" (p.290). Thus, in the course of training, the teacher is exposed to different conceptions that have not been addressed from the real classroom environment, therefore, there are gaps that the teacher will have to face in the development of their profession, which leads to the fact that their conceptions may be exposed to change in the course of their work experience.

For Ponte (1992) conceptions are derived from different senses, among them: the nature, theories, types and social and individual character of knowledge, for this research those referring to mathematical knowledge and mathematics were described; problem solving related to dynamism, absolutism which is related to Platonism, and instrumentalism also related to absolutism. When referring to a conception framed in absolutism and instrumentalism one has a vision of mathematics as the set of facts, procedures and theorems and the dynamic conception seeing the domain of mathematics driven by problem solving and meaningful constructions. In this research, in order to identify beliefs of mathematics teachers, some

conceptions are proposed for the unit of analysis; taking into account the theories of Ponte (1992) and Godino (2004), and through the experience of this research and the different approaches to mathematics education as well as its didactics.

Methodology

Considering that research on pedagogical practices includes several elements such as the conceptions of teachers in relation to their practice, their professional academic training to be a mathematics teacher, among others, this is done directly from the reality and experience that teachers live in the educational field, for this reason the research was developed under a qualitative-descriptive approach. According to Corbetta (2007) this is understood as an intervention on reality itself, in which the researcher places himself as much as possible within the subject of analysis. The research was carried out through a case study according to Stake (1999), since they constitute elements of the qualitative approach, which allows describing and interpreting each situation in a naturalistic environment and for this it is required to take into account the qualitative paradigm. Within the unit of analysis, the participation of 5 graduate teachers of the Bachelor's degree program in Mathematics at UPTC, with experience no more than 5 years, graduated as of 2015, was counted.

Technique and instruments used

The questionnaire was used as instruments for the collection of information. Three questionnaires with closed and open questions were applied, the first with the objective of inquiring some aspects about the teaching of mathematics at the basic secondary and middle school level, the second with the objective of inquiring some aspects about their professional training as graduates of the LM program of the UPTC, and the third questionnaire with the objective of identifying the conceptions that the beginning teachers have about mathematics.

In the same way, classroom observation was carried out in order to describe the actions in the classroom of the beginning teachers, the observation of a class recording of each participant was made, with the objective of examining attitudes, resources and methodologies applied and relevant expressions within the classroom, and finally, a triangulation of the information was made based on three categories of analysis, each one with two subcategories: training (secondary, middle and university), conceptions (Mathematics, Mathematics Education) and experience (In training and in practice).

Conclusions

The research allowed us to identify that the pedagogical practices of beginning teachers are affected by their training at different educational levels, as well as the conceptions about mathematics that their educators have had as their own.

On the other hand, it was evidenced that the teachers of the unit of analysis, having a minimum of classroom experience, adopt methodologies similar to those of their training teachers, this when the experiences have been generally positive or assume a contrary attitude if they have been negative. The student who prepares to become a Mathematics graduate acquires a conception of mathematics from what he visualized and learned from his educators and then transmits it as an educator in this area.

Likewise, the methodologies of the secondary education teachers of the unit of analysis coincide in considering mathematics as an abstract and pure science where the product is already elaborated, therefore, school tasks imply memorization and repetition of algorithms, which has prevailed with some university teachers and which is evidenced in some classroom actions of the teachers who were part of the research; However, when reviewing their conceptions of constructivism and dynamism, they agree with Rico and Sierra (1991) in that the mathematics teacher is moving from an instructive function to a broader educational function, where the

interests of the students, the context, the conceptual domain, the strategies, the creativity and the diverse thoughts of the students are important.

In the training of LM students at UPTC, it is necessary to implement teaching strategies that can set an example of what will be their work as professionals, not only including one or more subjects of the study of the didactics of mathematics, but that are implemented by LM teachers, since "each teacher tends to use in his teaching those ways and means that he has seen the teachers he has had use" (De la Torre et al, 2006, p. 26). Thus, the profile for the LM teacher must be considered, in addition to the reforms to the curricula.

The pedagogical practices of beginning teachers in some cases are seen as replicas of the classes of their training teachers, evidenced in the use of the same resources (books) and in the repetition of algorithms, for this reason it is pertinent to review the objective they fulfill in the teaching and learning process; since in classroom actions when a technological resource is presented, the class tends to be more dynamic and there is more interaction between the teacher and the students.

Beginning teachers adopt different conceptions of mathematics (idealism, instrumentalism, constructivism and dynamism), depending on the one they adopt, so will be their pedagogical practices, then, if the teacher demands a complete and orderly procedure is framed in an idealism, if the teacher asks to model a situation of a particular context, it would be framed in a constructivism or dynamism.

Finally, it is important to consider that reflection on the pedagogical practices of mathematics teachers is essential for the improvement of educational quality, and this is achieved through self-criticism and discussion among peers, to complement knowledge and acquire new techniques or advances in the didactics of mathematics, for which Rico

(2000) points out that it is necessary a continuous and permanent work by thousands of teachers regarding the innovation of reasoning habits and the appropriate way to acquire and teach them.

On the other hand, through this research, some errors were visualized in the classroom instruction of mathematical contents; therefore, it is convenient to carry out a study of the pedagogical practices associated with classroom actions and conceptual and notational errors in the explanation of mathematical objects. Finally, it is concluded that sometimes there is no relation between what is believed and what is done, since the teachers of the unit of analysis conceive mathematics from the perspective of critical mathematics education, but what is done in the classroom is focused on a traditional teaching framed most of the time in the repetition and mechanization of algorithms.

References

- Barrera, R. F., & Mejía, V. B. (2005). La interpretación de la práctica pedagógica de una docente de matemáticas. *Acta Colombiana De Psicología*, (14), 87–96. Disponible en: <https://actacolombianapsicologia.ucatolica.edu.co/article/view/426>.
- Carmona, R. (2015). Concepciones de Práctica Pedagógica en Docentes en Ejercicio de la ciudad de Pereira. [Tesis de maestría, Universidad Tecnológica de Pereira]. Disponible en Repositorio UTP. <https://repositorio.utp.edu.co/server/api/core/bitstreams/be9ee53b-902a-4cf3-8b6b-54720aed4e2c/content>
- Corbetta, P. (2007). *Metodologías y técnicas de investigación social*. España: Mc: Graw -Hill. Disponible en: <https://diversidadlocal.files.wordpress.com/2012/09/metodologc3ada-y-tc3a9cnicas-de-investigacic3b3n-social-piergiorgio-corbetta.pdf>.
- De la Torre, M., & Guerrero, S. (2006). Formación

- inicial y continua del profesorado de primaria y secundaria. Uno. *Revista de la didáctica de la matemáticas*. Formación del profesorado y matemáticas, 20-39.
- Díaz, V. (2006). Formación docente, práctica pedagógica y saber pedagógico. *Laurus*, 12(Ext), 88-103. Disponible en: <https://www.redalyc.org/articulo.oa?id=76109906>
- Fernandez, R., Hernández, S. C., Prada, R. N., & Ramirez, P. L. (2018). Dominio afectivo y prácticas pedagógicas de docentes de Matemáticas: Un estudio de revisión. *Espacios*, 39 (23), 25. Disponible en: <https://www.revistaespacios.com/a18v39n23/a18v39n23p25.pdf>
- Flores, C. D., García, G. M., Hernández, S. J., & Sosa, G. L. (2014). Matemática educativa: la formación de profesores. *Centro de Investigación en Matemática Educativa (CIMATE), UAGro*, 10-27. Disponible en: <https://www.editdiazdesantos.com/wwwdat/pdf/9788499696645.pdf>.
- Fonseca, C. J., & Castillo, S. M. (2013). Formación de docentes de matemática: aspectos relevantes. *uniciencia*, 27(1), 2-14. Disponible en: <https://www.redalyc.org/pdf/4759/475947762001.pdf>
- Gómez, A. (1991). Las matemáticas y el proceso educativo. En J. Díaz Godino, B. Gómez.
- Alfonso, A. Gutiérrez Rodríguez, L. Rico Romero, S. Vásquez, & M, Area de conocimiento. *Didáctica de la matemática* (págs. 59-104). Madrid: Síntesis.
- Godino, J, Font, & Batanero. (2004). Didáctica de la Matemática para maestros. Departamento de Didáctica de la Matemática, Universidad de Granada. Disponible en: https://www.ugr.es/~jgodino/edumat-maestros/manual/9_didactica_maestros.pdf
- Hernadéz, P., & Ruíz, B. (2014). Relación entre formación profesional y concepciones sobre el ser docente de estudiantes de Licenciatura. Universidad Sergio Arboleda. Disponible en: <https://repository.usergioarboleda.edu.co/discover>
- Maroto, A. (2009). Competencias en la formación inicial de docentes de Matemáticas. *Inter Sedes*, X(19), 89-108. Disponible en: <https://www.redalyc.org/pdf/666/66618371002.pdf>.
- Ministerio de Educación Nacional. (2006). Estándares básicos de competencias en Matemáticas. *Revolución Educativa Colombia Aprende*. en: <https://colombiaprende.edu.co/recurso-coleccion/estandares-basicos-de-competencias>.
- Niño, J. A., Hernández, C. A., & Bonilla, M. Y. (2018). Práctica pedagógica, dominio afectivo y procesos matemáticos de los docentes de matemáticas en el nivel de educación básica del sector público. *Eco matemático*, 10 (1) 19-27. Disponible en: <https://revistas.ufps.edu.co/index.php/ecomatematico/article/view/2538/2641>
- Ponte, J. (1992). Concepções dos Professores de Matemática e Processos de Formação. *Educação matemática: Temas de investigação*. Lisboa: Instituto de Inovação Educacional, 185-239. Disponible en: [https://repositorio.ul.pt/bitstream/10451/2985/1/92-Ponte%20\(Concep%C3%A7%C3%B5es\).pdf](https://repositorio.ul.pt/bitstream/10451/2985/1/92-Ponte%20(Concep%C3%A7%C3%B5es).pdf)
- Ramos, P. L., & Casas, G. L. (2018). Concepciones y creencias de los profesores de Honduras sobre la enseñanza, aprendizaje y evaluación de las matemáticas. *Revista Latinoamericana de Investigación en Matemática Educativa*, 21(3), 275-292.

- Disponible en: <https://www.scielo.org.mx/pdf/relime/v21n3/2007-6819-relime-21-03-275.pdf>.
- Rico, L. (2000). Consideraciones sobre el currículo de matemáticas para educación secundaria. En L. Rico, *La educación matemática en la enseñanza secundaria*. (págs. 15-38). Barcelona: Horsori. Disponible en: <http://funes.uniandes.edu.co/521/1/RicoL97-2528.PDF>.
- Rico, L., & Sierra, M. (1991). La comunidad de educadores matemáticos. En J. Díaz Godino, B. Gómez Alfonso, A. Gutiérrez Rodríguez, L. Rico Romero, & M. Sierra Vásquez, *Area de conocimiento*. Didáctica de la matemática (págs. 11-58). Madrid: Síntesis.
- Rodríguez, H. (2006). Práctica Pedagógica. Una tensión entre la teoría y la práctica. *Pedagogía y saberes* (24) 19-25. Disponible en: <https://revistas.pedagogica.edu.co/index.php/PYS/article/view/6769/5529>
- Serres, Y. (2007). El rol de las prácticas en la formación de docentes en matemáticas. [Tesis doctoral]. https://www.matedu.cicata.ipn.mx/tesis/doctorado/serres_2007.pdf
- Shulman, L. (2005). Conocimiento y enseñanza: fundamentos de la nueva reforma. Profesorado. *Revista de curriculum y formación del profesorado*. 9(2), 1-30. Disponible en: <https://www.ugr.es/~recfpro/rev92ART1.pdf>
- Stake, R. (1999). *Investigación con estudios de casos*. Ediciones Morata. Disponible en: <https://www.uv.mx/rmipe/files/2017/02/Investigacion-con-estudios-de-caso.pdf>
- Zapata, M. & Blanco, L. J. (2007). Las concepciones sobre las matemáticas y su enseñanza-aprendizaje de los profesores de matemáticas en formación. *Campo abierto*, 26(2), 83-108. Disponible en: <https://redined.educacion.gob.es/xmlui/handle/11162/28296>.
- Zuluaga, O. (1999). Pedagogía e historia. La historicidad de la pedagogía. La enseñanza, un objeto del saber. Santa Fe de Bogotá: Universidad de Antioquia. Disponible en: https://books.google.com.co/books/about/Pedagog%C3%ADa_e_historia.html?id=L3UQAAAAYAAJ&redir_esc=y.